

METHOD AND BLANK FOR FORMING A MULTI-PANEL CONTAINER

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TECHNICAL FIELD

This invention relates to a method for forming a multi-panel container having an enclosed, hollow interior. The  
10 invention also encompasses a blank utilized when forming a multi-panel container.

BACKGROUND OF THE INVENTION

As will be seen below, the present invention  
15 encompasses a unitary blank for forming a multi-panel container. A method is also encompassed by the present invention.

Boxes and other containers are commonly formed from unitary or integral blanks and there are literally hundreds if not thousands of containers, boxes, etc. formed from a unitary  
20 blank or from a multi-component blank, the nature of the container being adapted for both general and specific uses. These containers range from very simple to complex and from plain to decorative.

The following U.S. patents are known and are considered to be representative of the current state of the art: U.S.

Patent No. D442,862, issued May 29, 2001, U.S. Patent No. D457,028, issued May 14, 2002, U.S. Patent No. D459,652, issued July 2, 2002, U.S. Patent No. 6,027,819, issued February 22, 2000, U.S. Patent No. 4,517,251, issued May 14, 1985, U.S. Patent No. 4,001,964, issued January 11, 1977, U.S. Patent No. 3,730,818, issued May 1, 1973, U.S. Patent No. D303,500, issued September 19, 1989, U.S. Patent No. D264,184, issued May 4, 1982, U.S. Patent No. D202,920, issued November 16, 1965, U.S. Patent No. D438,105, issued February 27, 2001, U.S. Patent No. D360,824, issued August 1, 1995, U.S. Patent No. 4,917,291, issued April 17, 1990, U.S. Patent No. 2,562,261, issued July 31, 1951, U.S. Patent No. 727,723, issued May 12, 1903 and U.S. Patent No. 4,227,640, issued October 14, 1980.

The prior art indicated above does not teach or suggest the method and blank disclosed and claimed herein.

#### **DISCLOSURE OF INVENTION**

The method of this invention relates to formation of a multi-panel container having an enclosed, hollow interior from a unitary blank of sheet material of specialized construction. Utilizing the teachings of the present invention, a wide variety of decorative containers are readily produced following a unique method and while utilizing a unique blank having certain

structural features which can be varied and utilized to construct many different container configurations.

5 The method for forming a multi-panel container having an enclosed, hollow interior of the present invention includes the step of forming a unitary blank of sheet material having four blank outer edges, four blank corners and four blank quadrants, the blank quadrants meeting at a location on the blank spaced inwardly from the four blank sides.

10 In each blank quadrant, a double-ended, first fold line and a double-ended second fold line are created. According to the method, both ends of the first and second fold lines are interconnected and the first and second fold lines in each blank quadrant are spaced from one another between the connected ends thereof to define a side panel disposed completely within the  
15 blank quadrant.

The first and second fold lines in each blank quadrant are disposed on opposed sides of an imaginary diagonal line extending across the blank quadrant between opposed junctures formed by adjoining blank outer edges at the blank quadrant  
20 boundary.

The side panels at least partially surround and define a bottom panel, the side panels and the adjoining blank outer edges defining top panels.

The unitary blank is folded along all of the first fold lines located in all four quadrants thereof whereby the side panels extend upwardly from the blank bottom panel. The unitary blank is then folded along all of the second fold lines located in all four quadrants thereof whereby the top panels extend inwardly from the side panels over the bottom panel to enclose the hollow bottom interior.

Other features, advantages and objects of the present invention will become apparent with reference to the following description and accompanying drawings.

#### **BRIEF DESCRIPTION OF DRAWINGS**

Fig. 1 is a top, plan view of a square blank of sheet material, diagrammatically illustrating geometric features of the blank, including imaginary quadrant defining lines and imaginary diagonal lines extending across each quadrant;

Fig. 2 is a view similar to Fig. 1, but illustrating fold lines formed in each quadrant;

Fig. 3 is a view similar to Fig. 2, but without a depiction of the imaginary quadrant defining lines and diagonal lines;

Fig. 4 is an enlarged perspective view of the blank of Fig. 3;

Figs. 5 - 7 are perspective views illustrating consecutive stages in the formation of a container utilizing the method and blank of the present invention, Fig. 7 showing the fully assembled container;

5            Fig. 8 is a view similar to Fig. 2, but illustrating a second blank embodiment;

            Fig. 9 is a view similar to Fig. 4, but illustrating the second blank embodiment;

10           Fig. 10 is a bottom, perspective view of the container formed from the second blank embodiment;

            Fig. 11 is a top, perspective view of the assembled container formed from the blank of Fig. 8;

            Fig. 12 is a side, elevational view of the assembled container formed from the blank of Fig. 8;

15           Fig. 13 is an elevational view of a third blank embodiment of the invention;

            Fig. 14 is a top, perspective view of the blank of Fig. 13;

20           Fig. 15 is a perspective view illustrating the blank of Fig. 13 being converted into a container;

            Fig. 16 is a perspective view of the container formed from the third blank embodiment;

Fig. 17 is a top, plan view of a fourth blank embodiment;

Fig. 18 is a top, perspective view of the blank of Fig. 17;

5 Fig. 19 illustrates the blank of Fig. 17 being formed into a container; and

Fig. 20 illustrates a container made from the blank of Fig. 17.

#### **MODES FOR CARRYING OUT THE INVENTION**

10 Referring now to Fig. 1, a unitary blank of sheet material such as paperboard, plastic or the like is designated by reference numeral 10. The blank has four blank outer edges, four blank corners and four blank quadrants outlined by intersecting imaginary lines 12 and 14 disposed at right angles to one another  
15 and extending completely across the blank. That is, the quadrants are defined by the blank outer edges and the quadrant lines 12, 14 which form the boundaries of the blank quadrants. Also shown in Fig. 1 are imaginary diagonal lines 16. Each diagonal line 16 extends across a blank quadrant between opposed  
20 junctures formed by adjoining blank outer edges at the blank quadrant boundary. The blank quadrants meet at central location 18 on blank 10 spaced inwardly from the four blank sides.

Referring now to Fig. 2, in each blank quadrant, a double-ended first fold line 20 and a double-ended second fold

line 22 are created using suitable fabrication techniques such as scoring or perforating.

The first and second fold lines in each blank quadrant are spaced from one another between the connected ends thereof to define a side panel 24 disposed completely within the blank quadrant.

The first and second fold lines 20, 22 in each blank quadrant are disposed on opposed sides of their associated imaginary diagonal line 16. The side panels 24 in this embodiment extend the full lengths of their respective imaginary diagonal lines 16 and meet, as shown. The side panels 24 are of identical configuration and are mirror images of one another in adjoining quadrants. The connecting side panels 24 surround and define a bottom panel 30. The side panels 24 and the adjoining blank outer edges define generally triangular-shaped top panels 32.

Each of the first and second fold lines is curved over a portion of the length thereof and straight over a portion of the length thereof. The first and second fold lines are of the same length and are symmetrically disposed relative to their respective imaginary diagonal lines, being mirror images of one another.

Figs. 5 and 6 show sequential steps carried out in the formation of a container from the blank 10. In Fig. 5 the

integral blank 10 is shown in the process of being folded about all of the first fold lines 20 located in all four quadrants whereby the side panels 24 will extend upwardly from the blank bottom panel 30.

5               Next, the unitary blank is folded along all of the second fold lines 22 as shown in Fig. 6 whereby the top panels 32 will extend inwardly from the side panels over the bottom panel to enclose the hollow bottom interior. Fig. 7 shows the completely folded unit. The top panels may be secured in  
10           position by any suitable expedient such as stickers or adhesive tape (not shown).

              Figs. 8 - 12 depict another embodiment of the invention. In this instance, a four sided blank 40 also has four quadrants meeting at a central location on the blank. Fig. 8  
15           shows imaginary diagonal lines 42 extending across the quadrants. Disposed at opposite sides of each imaginary diagonal line 42 is a first fold line 44 including two straight first fold line segments and a second fold line 46 formed of two straight second fold line segments. The first fold lines 44 are longer than the  
20           second fold lines 46. The first and second fold lines 44, 46 define side panels 48.

              Side panels 48 surround and define a bottom panel 50 of cruciform configuration. Top panels 52 are defined by the outer boundaries of the quadrants and second fold lines 46. Folding of



the blank as depicted in Fig. 10 will result in formation of the container shown in Figs. 11 and 12.

5 Figs. 13 - 16 illustrate another embodiment of the invention. In this arrangement a blank 60 is changed from its flat state depicted in Figs. 13 and 14 to the configuration shown in Fig. 16. Fig. 15 illustrates the blank 60 in the process of being folded to form the container. In this arrangement, the ends of first fold lines 62 and second fold lines 64 terminate and connect at locations spaced inwardly from the boundaries of their respective quadrants. The cruciform bottom panel 66 is only partially surrounded by the side panels 68 formed by the first and second fold lines. Thus, the bottom panel extends to the outer edges of the blank and more particularly to recesses 70 formed in the four sides of the blank. In this embodiment lock tabs 72 are utilized to secure the top panels 74 together as shown in Fig. 16.

20 Figs. 17 - 20 show a four sided blank 80 which is folded from the flat condition illustrated in Figs. 17 and 18 to form the box or container shown in Fig. 20. Fig. 19 shows an intermediate stage during formation of the container. In this embodiment the blank 80 is in the shape of a rhomboid parallelogram. Also, there are two pairs of first fold lines - a pair of first fold lines 82 and a pair of first fold lines 84, the latter being shorter than the former. Likewise, there are

two sets of second fold lines, 86, 88, the latter being shorter than the former. This enables the blank, when folded, to form a generally rectangular shaped container having pointed corners as depicted in Fig. 20. Auxiliary fold lines 90 are formed in the  
5 blank between adjacent side panels 92, 94 to facilitate folding of the blank.